

**A new species of *Andrena* (*Onagrandrena*) from Utah's  
San Rafael Desert (Hymenoptera: Andrenidae)**

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*Abstract.*—A series of a large, distinctive, undescribed species of black *Andrena* belonging to the subgenus *Onagrandrena* was collected by Dr. Frank Parker, USDA Bee Biology and Systematics Laboratory, Logan, Utah during a survey of aculeate Hymenoptera from Utah's San Rafael Desert. It is related to a complex of species described by E. G. Linsley and J. W. MacSwain for their ecological studies of bees and Onagraceae of the Great Basin (Linsley, et al. 1963b). I describe the species at this time to include it in this volume dedicated to E. Gorton Linsley and to make the name available for a forthcoming review of the subgenus. The format and abbreviations used in the description follow those used by LaBerge (1967), with the exception that UCD is now RMB (R. M. Bohart Museum of Entomology).

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***Andrena* (*Onagrandrena*) *linsleyana* Thorp, NEW SPECIES**

*Female.*—*Measurements and Ratios.*—N=20; length, 14–15.5 mm; width, 4.8–5 mm; wing length,  $M=8.7 \pm 0.06$  mm; FL/FW,  $M=1 \pm 0.129$ ; FOVL/FOVW,  $M=2.8 \pm 0.007$ .

*Integumental Color.*—Black except as follows: mandible tips mahogany; antennal flagellomeres 3–10 brownish beneath; tegulae posteriorly mahogany; wing membrane infuscated, veins light yellowish brown; legs and basal areas of metasomal sternites mahogany.

*Structure.*—Antennal scape equal to flagellomeres 1 to 3; flagellomere 1 slightly shorter than 2 plus 3 combined (1:1.25); flagellomeres 2, 3 and 4 each as wide as long and equal to each other in length. Eyes 3 times as long as wide, inner margins essentially parallel. Malar space short, linear. Mandibles somewhat elongate, when closed outer mandible extends to end of labrum with subapical dorsal tooth surpassing midlabrum by two fifths length, without tooth or angle on basal inferior margin. Galea with outer margin angled outward from apex in straight line, then bending rearward to insertion of palpus; surface moderately dull, shagreened. Maxillary palpus nearly twice as long as galea; segmental ratio about (1.2:2.0:1.5:2.0:1.7:1.7). Labial palpus with first segment curved, somewhat flattened; segmental ratio about (2.0:1.2:1.0:1.5). Labral process short, tumid, converging and shallowly emarginate apically with two, very short, blunt teeth, longer than apical width, without basal depression (Fig. 2); labrum apical to process without transverse sulcus, with median longitudinal crista, with coarse, longitudinally elongate, nearly contiguous punctures. Clypeus convex; punctures coarse, separated by less than one diameter centrally, finer and nearly contiguous laterally and dorsally; surface shiny, with narrow median longitudinal impunctate line. Supraclypeal area dull, punctures nearly contiguous and finer than on clypeus.

Face above antennal fossae with coarse, contiguous punctures between fine longitudinal rugulae. Facial fovea long, extending below level of antennal bases and 2.8 times maximum width, width at top twice width at bottom and separated from lateral ocellus by 0.4 ocellar diameter, area between fovea and ocellus finely striate-punctate. Lateral ocelli 2.4 diameters from inner margins of compound eyes and about one diameter from the top of the vertex. Vertex above lateral ocellus dull, densely, moderately coarsely punctate. Genal area in profile broader than eye (about as 8:5), punctures finer than on clypeus, sparse, separated by 1–2 diameters centrally, closer, and separated by less than one diameter peripherally, surface dull, shagreened, shiniest centrally.

Pronotum with rounded humeral angle and without dorsoventral ridge, dull, finely, moderately sparsely punctate, shagreened posteriorly, shiny anteriorly. Mesoscutum dull with coarse, close punctures separated by less than one diameter, interspaces shagreened. Scutellum dull, punctures coarse, close (<1 diameter) becoming contiguous posteriorly. Metanotum dull, punctures coarse and contiguous. Propodeum with dorsal enclosure moderately rugose, irregular, without longitudinal rugae (Fig. 1); dorsolaterally and posteriorly dull, with coarse, close and vertically long-ovate punctures, laterally sparsely punctate in center of corbicular area. Fore wing with base of vein M ending about 2 vein widths anterior to cu-v.

Metasomal tergum 1 shiny with anterior face impunctate, rounded to dorsal sparsely punctate disk. Terga 2–4 shiny, finely, sparsely, punctate with punctures separated by 1–2 diameters, impunctate margin shiny, about one-fifth length of apical impressed area. Pygidial plate V-shaped with apex truncate, margins curved upwards, with distinct, raised internal triangular area grading apically and basolaterally toward margins, mediolaterally sharply declivous with fine striae extending onto depressed submarginal, impunctate, dull, shagreened area, surface of raised internal area finely, irregularly striate. Sterna 2–5 with basal areas sparsely, moderately finely punctate, separated by 3–4 diameters on sternum 2, becoming closer on succeeding sterna to 1–2 diameters on sternum 5, narrow apical areas impunctate, shiny, moderately transparent.

Vestiture.—Black. Propodeal corbiculum incomplete, dorsal hairs moderately long, straight, similar to other hairs above, with many internal hairs and only a ventral tuft of hairs anteriorly; trochanteral flocculus complete with moderately long curved hairs; tibial scopal hairs sparse, long (nearly twice tibial width), simple. Tergal hairs erect, long on tergum 1 (7 times as long as on tergum 2).

*Male.—Measurements and Ratios:*—N=20; length, 9.5–14.5 mm; width, 3–4.5 mm; wing length,  $M = 7.4 \pm 0.37$ ; FL/FW,  $M = 1.12 \pm 0.001$ ; FS1/FS2,  $M = 1.25 \pm 0.003$ .

*Integumental Color.*—Black with exceptions as in female.

*Structure.*—Antennal scape equal to first two and one fourth flagellomeres; flagellomere 1 longer than 2 (as 1.3:1.0), equal to 3; segment 2 as wide as long; segment 3 slightly longer than wide (as 1.3:1.0). Mandibles moderately long, when closed, outer mandible extends slightly beyond end of labrum. Malar space and galea as in female. Maxillary palpus as in female, but segmental ratio (1.0:1.5:1.3:1.7:1.3:1.7). Labial palpus as in female, but ratio about (1.5:1.0:1.0:1.3). Labral process wider than long (as 2.5:1.5), deeply emarginate with two teeth (Fig. 4); labrum apical to process convex, finely, sparsely punctate, shiny, without crista. Clypeus with sculpture as in female, except median impunctate

line more difficult to detect, especially above; shiny centrally. Supraclypeal area and face above antennal fossae as in female. Lateral ocelli separated from inner margin of compound eye by 3 diameters and from vertex by one diameter. Vertex sculptured as in female. Genal area in profile broader than eye (as about 7.5:5), sculpture as in female.

Pronotum with rounded humeral angle and without dorsoventral ridge, surface sculpture as in female. Mesoscutum and scutellum sculptured as in female. Propodeum sculptured as in female (Fig. 3). Fore wing with base of vein M as in female.

Metasomal terga 1–5 sculptured as in female. Tergum 7 with pseudopygidial area concealed by long hairs at lateral margin, V-shaped and broadly truncate apically. Sterna 2–5 punctate as in female. Sternum 6 with apical margin turned down slightly, without emargination. Sternum 7 emarginate apically. Sternum 8 with terminal shaft equal in length to that of broad base and with apex slightly emarginate. Penis valves moderately broadened medially, tips narrow, not exceeding tips of gonostyli; dorsal lobe of gonocoxite relatively narrow, acute apically shorter than base of gonocoxite (as 3:5); gonostyli enlarged nearly axe-shaped apically with concave outer face, longer than distance to apex of dorsal lobe of gonocoxite (as 3.5:1.5) (Figs. 5–6).

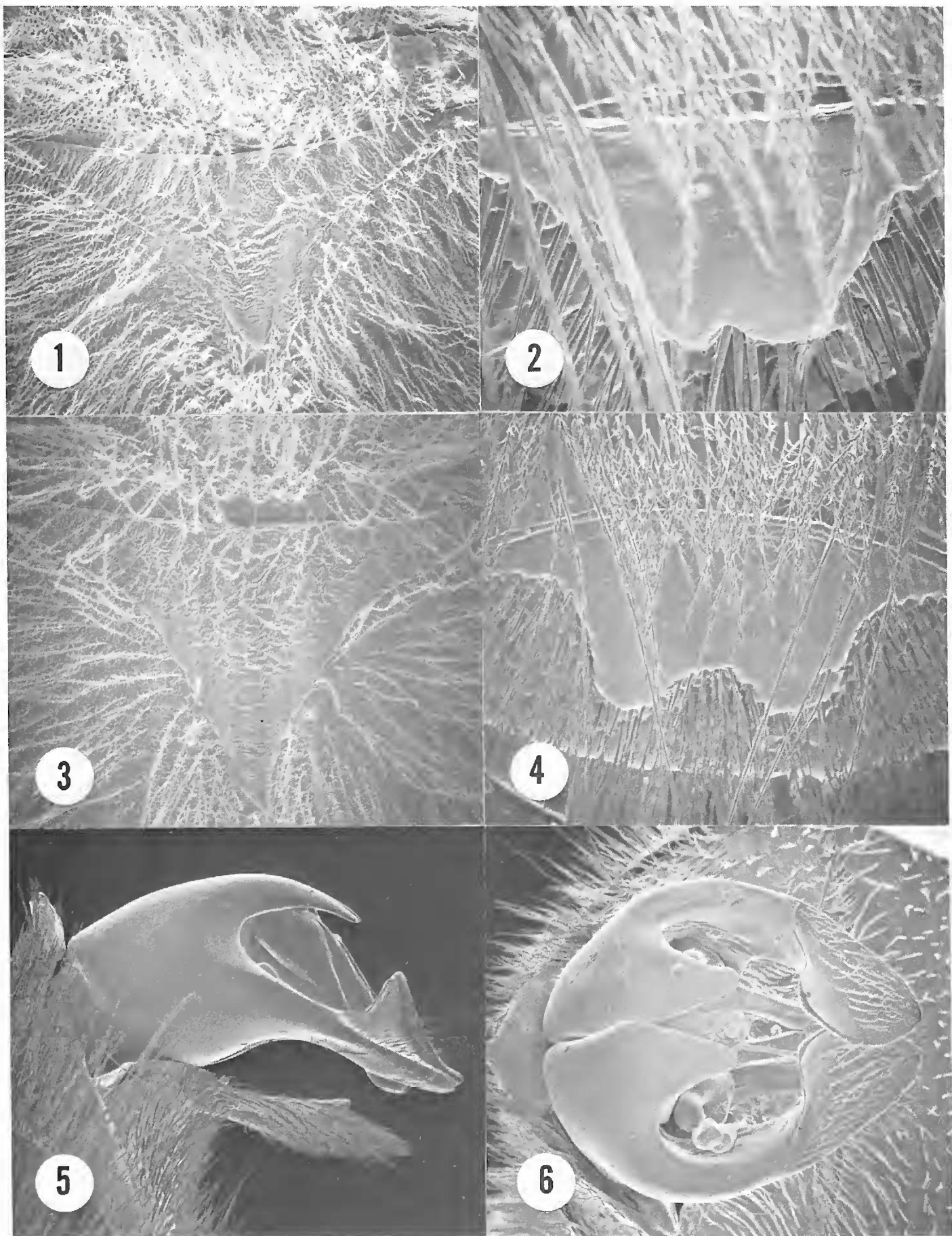
Vestiture.—Black.

*Type Material*.—The holotype female (USNM) and allotype (USNM), 8 female and 57 male paratypes (USU; CAS; CIS; RMB) were collected at Bullfrog Campground, Kane County, Utah, 21 April 1983 by F. D. and J. H. Parker. The type locality is near the end of the road at Lake Powell about 120 km south of Hanksville, Wayne County (confirmed by F. D. Parker, personal communication). An additional 11 female paratypes (USU) were collected as follows: UTAH: Emery Co.: 5,100', 4 air mi. N. Gilson Butte, 29 May 1981, F. D. Parker, 1 female on *Oenothera* and 6 females on Compositae; 4,900', Wildhorse Creek, N of Goblin Valley, 3 June 1982, F. D. Parker, T. L. Griswold, 4 females on *Oenothera*.

*Variation*.—Males vary considerably in size with their lengths ranging from 9.5–14.5 mm ( $M = 12 \pm 1.263$ ) while females vary only slightly with lengths ranging from 14–15.5 mm ( $M = 14.9 \pm 0.326$ ). The median longitudinal impunctate line of the clypeus of some males is reduced to the lower portion only.

*Systematics*.—*Andrena linsleyana* belongs to the species complex that includes: *A. (O.) chylismae-nevadae-thorpi-stagei* all described by Linsley and MacSwain. Its females can be separated from others of this complex by their larger size, the less pronounced and more irregularly rugose propodeal enclosure, the presence of a median longitudinal impunctate line on the clypeus, the shorter and more emarginate labral process. Males of *A. linsleyana* can be separated from those of *A. chylismae*, the only species of this complex for which males have been described, by their larger size, the less pronounced and more irregularly rugose propodeal enclosure, and the presence of a median longitudinal impunctate line on the clypeus. Males of both have all black pubescence. This is a unique characteristic among *Onagrandroidrena* of the Intermountain Region and will likely be true for other members of this species group as the males become known.

*Flower and Colleciton Records*.—According to Dr. F. D. Parker (personal communication) the specific floral records for the above are: *Oenothera pallida* Lindley and *Hymenopappus filifolius* Hook. and the bees were foraging as late as 11 A.M. I examined the specimens for pollen. All the bees collected on *Oenothera* bore small amounts of *Oenothera* pollen in their scopae. All the females collected on



Figures 1–6. *Andrena linsleyana*, paratypes. 1. Propodeal enclosure of female. 2. Labral process of female. 3. Propodeal enclosure of male. 4. Labral process of male. 5, 6. Male genital capsule lateral and apical views.

*Hymenopappus* had moderate amounts of pollen from Compositae on their faces below their antennae, but none in their scopae indicating that this was a nectar source. Its flight season is from late April into June. The specimens from Bullfrog Campground on 21 April 1981 are all very fresh. The collections made at the other

two sites in late May and early June show wear of the mandibles, hairs of the clypeus and labrum and of the wing tips. The presence of pollen in the scopae of the females and the lack of males in the latter collections also suggests that these were made near the end of the season for the bees.

*Discussion.*—Based on the flower records and pollen analyses, females of *A. linsleyana* presumably collect residual pollen in the morning from the evening opening *O. pallida* when the nectar supply in the deep hypanthium is low and forage for nectar on flowers of compositae. This is similar to the behavior of females of *A. (O.) linsleyi* Timberlake which forage in the morning for residual pollen from the nocturnal *O. deltoides* Torrey & Fremont and for nectar on *Geraea canescens* Torrey & Gray in the Colorado Desert of California (Linsley, et al. 1963a). Females from Bullfrog Campground were collected at a nest site and males were found sleeping in shallow burrows under rocks (F. D. Parker, personal communication).

The Canyon Lands subdivision of the Colorado Plateau Province which contains the San Rafael Desert of Utah has the greatest number of endemic plant species of any part of the Intermountain Region (Cronquist, et al. 1972). The San Rafael Desert has produced several endemic bee species (F. D. Parker, personal communication) as well, so it is not surprising that *A. linsleyana* with the largest females of any *Onagrandroidrena* represents another endemic species.

*Etymology.*—I take great pleasure in naming this species in honor of Dr. E. Gorton Linsley who has contributed greatly to the understanding of the systematics and ecology of this subgenus of *Andrena* and who had a great influence on my career as my major professor and mentor during my graduate years at Berkeley.

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#### LITERATURE CITED

- Cronquist, A., A. H. Holmgren, N. H. Holmgren and J. L. Reveal. 1972. Intermountain flora. Vol. 1. Hafner Publ. Co., NY. 270 pp.
- LaBerge, W. E. 1967. Revision of the bees of the genus *Andrena* of the Western Hemisphere. Part I. *Callandrena*. (Hymenoptera: Andrenidae). Bull. Univ. Nebraska State Mus. 7:1-318.
- Linsley, E. G., J. W. MacSwain and P. H. Raven. 1963a. Comparative behavior of bees and Onagraceae. I. *Oenothera* bees of the Colorado Desert. Univ. Calif. Publs. Entomol. 33:1-24.
- . 1963b. Comparative behavior of bees and Onagraceae. II. *Oenothera* bees of the Great Basin. Univ. Calif. Publs. Entomol. 33:25-58.